



{In Archive} Interesting article from the National Academy of Science on aquifer storage

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NAS Panel Says Water Quality Rules May Impede Underground Storage

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A recent report from a National Academy of Sciences' (NAS) panel says some water quality regulations may cause significant barriers for managed underground storage (MUS) of water -- a key option for ensuring adequate water supplies.

The Oct. 26 report, *Prospects for Managed Underground Storage of Recoverable Water*, comes as a new House bill would expand EPA research into water conservation technology and approaches, including water storage and distribution systems. The legislation notes that 36 states are anticipating some type of water shortage by 2013 and climate change effects are expected to exacerbate already scarce water resources in many parts of the country.

The NAS report says that in the future, multiple strategies will likely be needed to manage water supplies and meet water demands for municipal and industrial uses, agricultural irrigation and environmental protection. And water storage facilities, including MUS, will be an essential component of water management, particularly in areas like the arid Southwest where water availability varies greatly over seasons or years.

But even while endorsing MUS and encouraging its use, the report also acknowledges several scientific data gaps and legal issues that may hinder wider use of MUS and makes more than a dozen recommendations addressing hydrology, water quality, legal concerns and operational considerations.

For example, the Clean Water Act (CWA) prohibits activities that would degrade water quality, which could prevent MUS as an option if regulators believe the stored water -- including potable water, stormwater or recycled water -- will degrade native groundwater, the report says.

“Rigid antidegradation policies can impede MUS projects by imposing costly pretreatment requirements, and may have practical effect of prohibiting MUS, even in circumstances where the prospects of endangering human or environmental health are remote and the benefits of water supply augmentation are considerable,” the report says.

Therefore, state laws and regulations should provide regulatory agencies with discretion to consider weighing the overall benefits of MUS while resolutely protecting groundwater quality,

the report says.

Another concern the report raises is that federal regulatory requirements are inconsistent. Federal underground injection control (UIC) rules, governed by the Safe Drinking Water Act (SDWA), only address projects that recharge or dispose of water directly to the subsurface through recharge wells, while infiltration projects are regulated by state governments with varying regulatory standards.

States with active aquifer storage and recovery regulatory programs have questioned the appropriateness of UIC regulation for MUS, and there are also inconsistencies between the CWA and SDWA that impact MUS systems, the report says. Federal and state regulatory programs should be examined to see if continued federal regulation is needed and the risks presented by inadequate state regulation, the report says, adding that a model state code should be drafted to assist states in developing a comprehensive regulatory program that reflects “a scientific approach to risk.”

The report also makes specific research recommendations on how to close data gaps in determining the hydrologic feasibility of an MUS system in different parts of the country, the impacts of MUS systems on surface water, and the hydrological properties of aquifers and their impacts on the performance of the MUS system.

On the issue of water quality, NAS calls for research to better understand the contaminants that might be present in potential sources of recharge water, noting that limited data exist on the use of urban stormwater for MUS systems. “Research should be conducted to evaluate the variability of chemical and microbial constituents in urban stormwater and their behavior during infiltration and subsurface storage to establish the suitability of combining MUS with stormwater runoff,” the report says.

NAS says additional research should be conducted to understand the potential removal processes for microbes and contaminants in different types of aquifer systems, noting that this information could help reduce impediments to public acceptance of MUS systems.

Meanwhile, Rep. Jim Matheson (D-UT) has [introduced legislation](#), H.R. 3957, to make water conservation a national priority and expand EPA research and development of technologies that will achieve greater water use efficiency.

The main intent of the legislation is to emphasize that water conservation is as important as energy conservation, a Matheson spokeswoman says. The bill would use EPA’s WaterSense program to “get the word out” about water conservation but would go beyond the current program, which the spokeswoman says is in “skeleton form.” WaterSense promotes water-efficient products and services through a labeling program similar to the Energy Department’s Energy Star program. EPA has given WaterSense designations to high-efficiency toilets, bathroom sink faucets and showerheads, as well as landscape irrigation services and weather- or sensor-based irrigation control technologies.

In his opening statement before an Oct. 30 hearing on H.R. 3957, the House Science Committee’s energy and environmental panel chairman Nick Lampson (D-TX) said the bill “will

provide us with several important tools to address the coming [water] crisis with technology and innovative thinking.”

Witnesses at the hearing, including Glen Diagger, an official with CH2M Hill, said critical federal support is needed for research and development of water efficiency technology, in order to move basic technology into widespread use.

Val Little, director of the Water Conservation Alliance of Southern Arizona, said her organization supports technological efforts to conserve water, but added that implementation of the technology is an equally important component. “In general, water conservation technologies are far ahead of our ability to educate and train the users and the consumers in the effective use of these tools. A national effort to lessen this disparity is essential.”

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